Section 40 - Leaks from Synthetic Organic Chemical, Polymer, and Resin Manufacturing Equipment.

1/11/93

a. Applicability.

1. i. This Section applies to all equipment in volatile organic compound (VOC) service in any process unit at a synthetic organic chemical, polymer, and resin production facility which manufactures, as an intermediate or end product, *Methyl tert-Butyl Ether*, *Polyethylene*, *Polypropylene, Polystyrene*, and those organic chemicals given in Section 60.489 of 40 CFR, Part 60 (July 1, 1992).

ii. A piece of equipment is not in VOC service if the VOC content of the process fluid can never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used:

A. Procedures that conform to the general methods in ASTM E260, E168, and E169 shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment.

B. Organic compounds that are considered by the Administrator of the U.S. EPA to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid.

C. Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in VOC service. If the Department disagrees with the judgment, paragraphs (i)(2)(i), (i)(2)(ii), and (i)(2)(iii) of this Section shall be used to resolve the disagreement.

2. This Section does not apply to any synthetic organic chemical, polymer, or resin manufacturing facility whose annual design production capacity is less than 1,000 megagrams (Mg) (1,100 tons) of product.

3. The requirements of paragraph (d) of this Section do not apply to:

i. Any equipment in vacuum service.

ii. Any pressure-relief valve that is connected to an operating flare header or vapor recovery device.

iii. Any liquid pump that has a dual mechanical pump seal with a barrier fluid system.

iv. Any compressor with a degassing vent that is routed to an operating VOC control device.

b. Definitions. As used in this Section, all terms not defined herein shall have the meaning given them in the November 15, 1990 Clean Air Act Amendments, or in Section 2 of this regulation.

"[In] gas/vapor service" means that the piece of equipment in VOC service contains process fluid that is in the gaseous state at operating conditions.

"[In] heavy liquid service" means that the piece of equipment in VOC service is not in gas/vapor service or not in light liquid service.

"[In] light liquid service" means that the piece of equipment in VOC service contacts a fluid that contains greater than 10 percent by weight light liquid and meets the following conditions: (1) the vapor pressure of one or more of the components is greater than 0.3 kiloPascal (kPa) (0.044 inch of mercury [in. Hg]) at 20°C (68°F) (standard reference tests or ASTM D-2879 shall be used to determine the vapor pressures); and (2) the fluid is a liquid at operating conditions.

"Process unit" means components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 40 CFR 60.489 (July 1, 1992). A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.

"[In] vacuum service" means that the equipment in VOC service is operating at an internal pressure that is at least 5 kPa (0.73 in. Hg) below ambient pressure.

"[In] VOC service" means that the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight. The provisions of paragraph (a)(1)(ii) of this Section specify how to determine that a piece of equipment is not in VOC service.

c. Standards: General. The owner or operator of a synthetic organic chemical, polymer, or resin manufacturing facility subject to this Section shall ensure that:

1. Any open-ended line or valve is sealed with a second valve, blind flange, cap, or plug except during operations requiring process fluid flow through the open-ended line or valve.

2. When a second valve is used, each open-ended line or valve equipped with a second valve is operated in such a manner that the valve on the process fluid end is closed before the second valve is closed.

3. When a double block-and-bleed system is used, the bleed valve or line is open only during operations that require venting of the line between the block valves and is closed at all other times.

d. Standards: Equipment inspection program. The owner or operator of a synthetic organic chemical, polymer, or resin manufacturing facility shall conduct the equipment inspection program described in paragraphs (d)(1) through (d)(3) of this Section using the test methods specified in **Appendix "F"** of this regulation.

1. The owner or operator of a synthetic organic chemical, polymer, or resin manufacturing facility shall conduct quarterly monitoring of each:

i. Compressor.

ii. Pump in light liquid service.

iii. Valve in light liquid service, except as provided in paragraphs (e) and (f) of this Section.

iv. Valve in gas/vapor service, except as provided in paragraphs (e) and (f) of this Section.

v. Pressure relief valve in gas/vapor service, except as provided in paragraphs (e) and (f) of this Section.

2. The owner or operator of a synthetic organic chemical or resin manufacturing facility shall conduct a weekly visual inspection of each pump in light liquid service.

3. The owner or operator of a synthetic organic chemical, polymer, or resin manufacturing facility shall monitor each pressure relief valve after each overpressure relief to ensure that the valve has properly reseated and is not leaking.

4. i. When an instrument reading of 10,000 parts per million (ppm)

or greater is measured, it shall be determined that a leak has been detected.

ii. If there are indications of liquid dripping from the equipment, it shall be determined that a leak has been detected.

5. When a leak is detected, the owner or operator shall affix a weatherproof, readily visible tag in a bright color such as red or yellow bearing the equipment identification number and the date on which the leak was detected. This tag shall remain in place until the leaking equipment is repaired. The requirements of this paragraph apply to any leak detected by the equipment inspection program and to any leak from any equipment that is detected on the basis of sight, sound, or smell.

e. Standards: Alternative standards for valves
Skip period leak detection and repair.

1. An owner or operator shall comply with the requirements for valves in gas/vapor service and valves in light liquid service as described in paragraph (d) of this Section except as provided in paragraph (e)(2) of this Section.

2. i. If the percent of valves leaking is equal or less than 2.0 for two consecutive quarters, an owner or operator may skip alternate quarterly leak detection periods for the valves in gas/vapor and light liquid service.

ii. If the percent of valves leaking is equal to or less than 2.0 for five consecutive quarters, an owner or operator may skip three of the quarterly leak detection periods per year for the valves in gas/vapor and light liquid service, provided that each valve shall be monitored once each year.

iii. If at any time the percent of valves leaking is greater than 2.0, the owner or operator shall resume compliance with the requirements in paragraph (d) of this Section but may again elect to comply with the alternative standards in paragraph (e) of this Section.

iv. The percent of valves leaking shall be determined by dividing the sum of valves found leaking during current monitoring and previously leaking valves for which repair has been delayed by the total number of valves subject to the requirements of this Section.

v. An owner or operator shall keep a record of the percent of valves found leaking during each leak detection period.

f. Standards: Alternative standards for unsafe-to-monitor valves and difficult-to-monitor valves.

1. Any valve is exempt from the requirements of paragraph (d) as an unsafe-to-monitor valve if:

i. The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (d).

ii. The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

2. Any valve is exempt from the requirements of paragraph (d) as a difficult-to-monitor valve if:

i. The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters (m) (6.6 feet [ft]) above a support surface.

ii. The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

3. The alternative standards of paragraph (e) are not available to valves subject to the requirements of paragraph (f) of this Section.

g. Standards: Equipment repair program. The owner or operator of a synthetic organic chemical, polymer, or resin manufacturing facility shall:

1. Make a first attempt at repair for any leak not later than 5 calendar days after the leak is detected.

2. Repair any leak as soon as practicable, but not later than 15 calendar days after it is detected except as provided in paragraph (h) of this Section.

h. Standards: Delay of repair.

1. Delay of repair of equipment for which a leak has been detected is allowed if repair is technically infeasible without a process unit shutdown. Repair of such equipment shall occur before the end of the first process unit shutdown after the leak is detected.

2. Delay of repair of equipment is also allowed for equipment that is isolated from the process and that does not remain in VOC service after the leak is detected.

3. Delay of repair beyond a process unit shutdown is allowed for a valve, if valve assembly replacement is necessary during the process unit shutdown, and if valve assembly supplies have been depleted, where valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the first process unit shutdown is not allowed unless the next process unit shutdown occurs sooner than 6 months after the first process unit shutdown.

i. Test methods and procedures.

1. In conducting the monitoring required to comply with paragraph (d) of this Section, the owner or operator shall use the test methods specified in **Appendix "F"** of this regulation.

2. The owner or operator shall demonstrate that a piece of equipment is in light liquid service by showing that all of the following conditions apply:

i. The vapor pressure of one or more of the components is greater than 0.3 kPa (0.044 in. Hg) at 20°C (68°F) standard reference texts or ASTM D2879 shall be used to determine the vapor pressures.

ii. The total concentration of the pure components having a vapor pressure greater than 0.3 kPa (0.044 in. Hg) at 20°C (68°F) is equal to or greater than 20 percent by weight.

iii. The fluid is a liquid at operating conditions.

3. Samples used in conjunction with paragraphs (i)(2) and (i)(3) of this Section

shall be representative of the process fluid that is contained in or contacts the equipment.

j. Recordkeeping requirements.

1. Each owner or operator subject to the provisions of this Section shall comply with the recordkeeping requirements of this Section.

2. An owner or operator of more than one facility subject to the provisions of this Section may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility.

3. When each leak is detected as specified in paragraph (d) of this Section, the following information shall be recorded in a log and shall be kept for 5 years in a readily accessible location:

i. The instrument and operator identification numbers and the equipment identification number.

ii. The date the leak was detected and the dates of each attempt to repair the leak.

iii. The repair methods employed in each attempt to repair the leak.

iv. The notation "Above 10,000" if the maximum instrument reading measured by the methods specified in **Appendix "F"** of this regulation after each repair attempt is equal to or greater than 10,000 ppm.

v. The notation "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after the leak is discovered.

vi. The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.

vii. The expected date of successful repair of the leak if a leak is not repaired within 15 days.

viii. The dates of process unit shutdowns that occur while the equipment is unrepaired.

ix. The date of successful repair of the leak.

4. A list of identification numbers of equipment in vacuum service shall be recorded in a log that is kept in a readily accessible location.

5. The following information for valves complying with paragraph (e) of this Section shall be recorded in a log that is kept for 5 years in a readily accessible location:

i. A schedule of monitoring.

ii. The percent of valves found leaking during each monitoring period.

6. The following information pertaining to all valves subject to the requirements of paragraph (f) of this Section shall be recorded in a log that is kept for 5 years in a readily accessible location:

i. A list of identification numbers for valves that are designated as unsafe to monitor, an explanation for each valve stating why the valve is unsafe to monitor, and the plan for monitoring each valve.

ii. A list of identification numbers for valves that are designated as difficult to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the schedule for monitoring each valve.

7. The following information shall be recorded in a log that is kept for 5 years in a readily accessible location for use in determining exemptions as provided in paragraph (a) of this Section:

i. An analysis demonstrating the design capacity of the affected facility.

ii. Information and data used to demonstrate that a piece of equipment is not in VOC service.

k. Reporting. The owner or operator of any facility containing sources subject to this Section shall comply with the requirements in Section 5 of this regulation.